

THE ROLE OF DYSFUNCTION IN EVOLUTION: A Companion to "The Care Primitive in Evolutionary Theory"

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Abstract: Dysfunction is commonly framed in evolutionary theory as either noise or creative destruction. This paper proposes a more precise definition grounded in the Function of Care: Dysfunction occurs when the relationship between a singular and the larger system that sustains it becomes sufficiently imbalanced to threaten the persistence of either or both. Within geological time frames, an irreversible loss of relational variety and recovery capacity indicates evolutionary dysfunction. We distinguish this from change, competition, suffering, and intention, illustrating that the diagnostic applies across scales from the chemical to the ecological, from the social to the artificial. The novel claim is that dysfunction is subtractive, not creative: It removes options so the creativity that sometimes follows collapse is the Function of Care reasserting itself. The implication is that the protection and restoration of variety is a measurable, testable criterion for evaluating any intervention in a complex system.

Keywords: Function of Care, Care primitive, dysfunction, variety, resilience, evolutionary theory, relationship, adaptation.

1. INTRODUCTION

1.1 The Function of Care

The Function of Care is a relational property of persistence [1]. It is not a moral value, not an emotion, and not a human invention. It is the functional pattern by which any persistent singular — an organism, a species, an ecosystem, a cell, a community — regulates its relationship with the conditions upon which its continuation depends.

Persistence is not a property of the singular alone. It is a property of the relationship between the singular and the whole that sustains it. A singular persists insofar as its relationships with the larger systems of which it is part continue to sustain the whole — which, in turn, sustains the singular.

This relational function is directional. It has two vectors:

IN vector: orientation toward the maintenance of the singular. Necessary.

OUT vector: orientation toward the whole that sustains the singular. Also necessary.

1.2 The Problem with "Dysfunction"

The word dysfunction usually assumes a correct function whose absence or corruption can be identified. This framing is intuitive but imprecise, because it requires knowing what the system is "for."

Within the Function of Care framework, dysfunction is defined relationally rather than by reference to an assumed purpose:

Dysfunction occurs when the relationship between a singular and the larger system that sustains it becomes sufficiently imbalanced to threaten the persistence of either or both.

Within geological time frames, an irreversible loss of relational variety and recovery capacity indicates evolutionary dysfunction [2].

This distinction is important. Not every reduction in variety constitutes dysfunction. Change, adaptation, succession, specialisation, competition, predation and disturbance may temporarily reduce variety while preserving or restoring the system's capacity for future relationships [3, 4].

Variety therefore functions here not as the definition of dysfunction, but as a diagnostic measure of relational health of dynamic systems.

This definition applies at every scale — chemical, molecular, cellular, organismal, ecological, social, and artificial.

2. WHAT DYSFUNCTION IS NOT

Dysfunction is not specialization. A highly specialized relationship between two species (e.g., obligate mutualisms) is not systemic dysfunction, provided the surrounding ecosystem maintains functional redundancy across other niches. Narrowing a single link in a resilient web is distinct from collapsing the web itself [5].

Dysfunction is not change. Change is constant and often creative [6]. Dysfunction is not the presence of change; it is the narrowing of what change can produce.

Dysfunction is not competition. Competition is a relationship. Dysfunction occurs only when competition eliminates the variety of relationships entirely — when one competitor wins so completely that the system becomes a monoculture [7].

Dysfunction is not suffering. Suffering can be therapeutic (fire, predation, immune response). Dysfunction is not the presence of suffering; it is the loss of the system's capacity to recover from it.

Dysfunction is not intention. A system can be dysfunctional without any agent intending it. Cancer, extinction, and civilisational collapse are structural outcomes, not moral ones.

3. THE DIAGNOSTIC: VARIETY AS THE MEASURE

If Evolutionary dysfunction is loss of variety, the diagnostic for any change is simple:

Does this change increase or decrease the range and density of relationships in the system?

If it increases variety (more relationships, more functional diversity, more redundancy, more options) → it is creative. It builds resilience [8].

If it decreases variety (fewer relationships, less diversity, less redundancy, fewer options) → it is dysfunctional. It builds brittleness.

This is measurable: species richness, functional diversity, network connectivity, genetic variation, soil biology, cultural diversity. On the other side: monocultures, extinctions, homogenisation, doctrinal uniformity.

This diagnostic grounds W. Ross Ashby's (1956) Law of Requisite Variety [9] — which establishes that a control system must possess at least as much variety as the perturbations it seeks to absorb — into biological and relational space. In living systems, variety is not mere excess; it is the reserve pool of functional relationships a system draws upon to absorb environmental shocks without collapsing [10].

4. DYSFUNCTION ACROSS SCALES

Chemical and physical systems

Self-organising systems far from equilibrium depend on diversity of pathways. When a single feedback loop dominates, the system loses response capacity (thermal runaway, oscillatory instability) [11].

Molecular and cellular systems

Cancer is the archetypal case: a cell line abandons cooperative signalling and proliferates without restraint, eliminating the functional variety of the tissue [12]. The organism collapses and takes the cancer with it. Recent work showing that certain cancer cells can be reoriented rather than destroyed illustrates the principle: restoration of relational variety is therapeutic [13].

Endosymbiosis is the counter-case — a gain of variety that expanded metabolic possibility [14].

Organismal systems

Loss of gut microbiome diversity correlates with immune dysregulation, metabolic disease, and reduced resilience [15, 16]. The Old Friends Hypothesis provides the mechanism: the immune system co-evolved with specific microorganisms and requires their presence for correct calibration [17].

Ecological systems

Monoculture agriculture maximises short-term yield and minimises relationships [18]. It is efficient and brittle. Invasive species that eliminate native diversity produce the same pattern [7]. Theoretical work confirms that species loss reduces the capacity of communities to compensate for further degradation [8].

Evolutionary systems

Mass extinctions are loss of variety at the largest scale. Genetic diversity loss in small populations creates extinction vortices — feedback loops in which loss of variety produces further loss of variety [2].

Social and artificial systems

Doctrinal uniformity narrows the range of possible responses. Narrow training distributions and single-objective optimisation produce the same brittleness in information systems: high performance on known inputs, catastrophic failure on novel ones [19].

5. THE ROLE OF DYSFUNCTION IN EVOLUTION

Even in the simple case of crystallisation, a solution that produces a single crystal form excludes the possibility of other structures. The variety of the system has been reduced to a singular relationship. A crystal persists — it is stable, it lasts. But it has zero dynamics. Every atom is locked into a single relationship, with no capacity to respond to change. It is persistence without function. It is what remains when variety has been fully lost. It is the clearest illustration of the principle: Options lost, not options created.

Dysfunction is not creative. It is subtractive. It removes options.

When a system collapses, it clears space. Something new can grow in that space. The asteroid that ended the Cretaceous cleared ecological room for mammalian diversification [2]. The collapse of a monoculture can open succession pathways [18].

But the creativity does not belong to the destruction. The creativity belongs to the Function of Care reasserting itself — rebuilding variety from whatever remains.

This reframes "creative destruction." Destruction is subtractive. What follows may be creative, but only if the system still retains enough variety to generate new relationships.

6. EXCEPTION RULES AND BOUNDARY CONDITIONS

Not all loss of variety is dysfunction. Natural succession [3, 4], seasonal cycles, and many fire regimes [4] involve temporary reductions followed by recovery. The diagnostic question is whether the system retains the capacity to restore its variety.

A recoverable reduction is change. An irreversible narrowing that eliminates the capacity for recovery is dysfunction. Drawing the line requires knowledge of the specific system and its history. Judgement is required; no universal algorithm exists.

Crucially, relationships operate non-exclusively across nested scales — relationships exist within relationships. Dysfunction is rarely contained to a single level; it cascades across scales. A localized cellular dysfunction (such as cancer) begins by disrupting neighbouring tissue signalling, scales upward to compromise an entire organ or limb, and ultimately threatens the persistence of the organism as a whole [12]. The "golden rule of exceptions" in biology demonstrates that when a local entity breaches its relational boundary, the resulting loss of variety ripples through the macro-system.

7. IMPLICATIONS

The variety diagnostic provides a measurable criterion for evaluating interventions in any complex system:

Measurement: species richness, functional diversity, network connectivity, genetic heterozygosity, response diversity [10].

Prediction: systems that lose variety become increasingly brittle and more prone to catastrophic shift.

Research agenda: systematic measurement of variety changes across ecological, social, and artificial interventions; correlation of variety loss with collapse events; identification of irreversible thresholds.

8. CONCLUSION

Evolutionary dysfunction is the loss of variety — the narrowing of the relational space that allows a system to persist through change.

The Function of Care is expressed, at the system level, as the maintenance of variety. Systems that maintain variety persist. Systems that lose variety collapse.

The role of dysfunction in evolution is therefore not creative. It is subtractive. Variety is the raw material of every future adaptation. Dysfunction is the loss of that material.

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